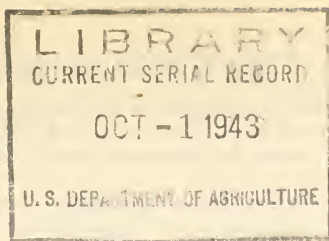


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## WARTIME FEED MIXTURES FOR CHICKENS

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### FACING THE FEED PROBLEM

**P**OULTRYMEN FACE A NEW FEED PROBLEM as a result of the war.

Many feeds normally used are now scarce or unavailable. Others are at times too costly to feed to chickens.

Supplies of a few feeds are normal or even larger than normal. Some comparatively new and valuable feedstuffs are also available.

The conditions call for new feed mixtures and changes in old ones.

### CONSERVING PROTEINS

Efficient use of feedstuffs of animal origin is especially necessary in our national economy.

Designed to obtain fair and equitable distribution of such materials among all users, a voluntary conservation program has been developed by the Feed Industry Council and the Department of Agriculture. The program limits the quantities of animal proteins that may be used in each 100 pounds of mixed feed for chickens. The limitations are as follows:

Chick starters, 2 pounds.

Broiler mashes, 2 pounds.

All-mash growing diets, 1.125 pounds.

Growing mashes to be fed with an equal quantity of grain, 2.25 pounds.

All-mash laying diets, 1.125 pounds.

Laying mashes to be fed with an equal quantity of grain, 2.25 pounds.

All-mash breeding diets, 2.25 pounds.

Breeding mashes to be fed with an equal quantity of grain, 4.50 pounds.

The program provides also for the reservation of fish meal for use in starters, broiler mashes, and feed mixtures for breeding stock. This rule does not apply, however, in emergency cases or in areas where other animal-protein feedstuffs are not available.

## NEW FORMULAS SUGGESTED

Profits on poultry operations will depend in no small measure on how well the feeding problem is solved. How and what to feed are questions that must be answered largely on the basis of the local situation.

Under present conditions it is sometimes impossible or impracticable to use the feed formulas recommended by the Department of Agriculture in Farmers' Bulletin 1841, The Feeding of Chickens, and in other publications of the Department. The new formulas in the tables in this leaflet are therefore suggested.

The mixtures are not as good as could normally be made, but were formulated to meet conditions existing in the spring of 1943. They are comparatively cheap and will give satisfactory results. In experiments at the Beltsville Research Center, Beltsville, Md., the average weight of Rhode Island Red chickens, when fed on mixtures of the types suggested and in groups of approximately equal numbers of both sexes, was a little more than 2 pounds at 10 weeks of age.

Formulas of suggested substitutes for fish meal, meat scrap, dried skim milk or dried buttermilk, and alfalfa meal are also given. The substitutes can be used in all-mash starting or starting-and-growing diets containing at least 21 percent of total protein and in all-mash laying diets containing at least 16 percent of total protein.

## SOME POINTS TO REMEMBER

In using the new formulas points to be remembered are:

Only properly cooked or heat-treated soybean meal should be used in mixtures containing large quantities of this feedstuff.

Alfalfa meal containing not less than 90,000 International units of vitamin A activity per pound is preferable. An alfalfa meal of lower potency may be used, however, if other ingredients in the mixture supply enough additional vitamin A activity.

Other fermentation products and byproducts may be used in place of the dried distillers' solubles as a source of riboflavin and of the other vitamins of the B-G complex. The riboflavin content of these other products ranges from 5,500 to 112,000 micrograms per pound. In calculating the amount of substitute product to use the riboflavin content of the dried distillers' solubles may be estimated at 9,000 micrograms per pound.

The suggested feed mixtures in tables 1 to 7 contain all the calcium chickens require. Additional calcium in the form of oystershell or limestone grit is therefore unnecessary and undesirable.

Use of insoluble grit with these mixtures is not objectionable. It is worth while to provide a small quantity of such material at regular intervals where chickens are confined or, for some other reason, are unable to pick up small stones and pebbles from their range.

## MINERALS AND VITAMINS

The feed formulas recommended call for manganized salt. This will aid in preventing perosis. It may be prepared by mixing 100 pounds of fine, free-flowing dairy or table salt and 2.5 pounds of finely pulverized technical anhydrous manganous sulfate, available at feed supply stores and some drug stores.

The vitamin A and D feeding oil should contain 400 A. O. A. C. chick units<sup>1</sup> of vitamin D and 2,000 International units of vitamin A per gram, or about 181,500 of the chick units of vitamin D and 907,500 units of vitamin A per pound. The vitamin A content is not so important if high-grade alfalfa meal is included in the feed mixture.

If vitamin A and D feeding oil is not available, a quantity of D-activated animal sterol that supplies the same quantity of vitamin D may be used, provided the other ingredients of the diet supply sufficient vitamin A.

Make the maximum use of sunshine and good grass range. Sunshine is the cheapest source of vitamin D, and fresh green feed, especially short young grass, is an excellent source of all the other known vitamins.

TABLE 1.—Suggested all-mash chick-starting diets

Ingredient	Diet No.					
	1	2	3	4	5	6
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Ground yellow corn	20.0		42.0	32.0		42.0
Ground wheat	32.0	10.0		10.0	52.0	
Ground barley, mlo, or begari		42.0				
Ground oats or wheat middlings			10.0	10.0		10.0
Soybean meal	21.0	21.0	24.0	23.0	21.0	23.0
Cottonseed meal, peanut meal, corn gluten meal, hempseed meal, sesame meal, or soybean meal	10.0	10.0	10.0	10.0	10.0	10.0
Fish meal			2.0			2.0
Meat scrap		2.5			3.0	
Dried skim milk or dried buttermilk	5.0			4.0		
Dried whey		5.0	5.0	4.7		
Alfalfa meal	7.7	6.0			8.0	5.7
Dried distillers' solubles			2.7	2.0	2.6	3.0
Steamed bonemeal	2.0	1.1	2.0	2.0	1.0	2.0
Ground limestone or oystershell	1.2	1.3	1.2	1.2	1.3	1.2
Manganized salt	1.0	1.0	1.0	1.0	1.0	1.0
Vitamin A and D feeding oil	.1	.1	.1	.1	.1	.1
Total	100.0	100.0	100.0	100.0	100.0	100.0

TABLE 2.—Suggested all-mash chick-growing diets

Ingredient	Diet No.					
	1	2	3	4	5	6
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Ground yellow corn	34.0		54.0	44.0	10.0	54.0
Ground wheat	30.0	10.0		10.0	54.0	
Ground barley, mlo, or begari		54.0				
Ground oats or wheat middlings			10.0	10.0		10.0
Soybean meal	15.0	15.0	19.0	19.0	15.0	15.0
Cottonseed meal, peanut meal, corn gluten meal, hempseed meal, sesame meal, or soybean meal	5.0	5.0	5.0	5.0	5.0	5.0
Fish meal			1.0			1.7
Meat scrap		1.0			2.0	
Dried skim milk or dried buttermilk	3.0			1.8		
Dried whey		6.0	4.0	4.1		
Alfalfa meal	8.0	6.0			8.0	8.0
Dried distillers' solubles	2.0		3.9	3.0	3.0	3.3
Steamed bonemeal	1.0	1.0	1.0	1.0	1.0	1.0
Ground limestone or oystershell	1.0	1.0	1.0	1.0	1.0	1.0
Manganized salt	1.0	1.0	1.0	1.0	1.0	1.0
Vitamin A and D feeding oil	(?)	(?)	.1	.1	(?)	(?)
Total	100.0	100.0	100.0	100.0	100.0	100.0

<sup>1</sup> This is the official unit of the Association of Official Agricultural Chemists.

<sup>2</sup> If the chickens do not have access to direct sunlight, add 0.1 percent of vitamin A and D feeding oil.

TABLE 3.—Suggested chick growing mash<sup>1</sup>s with which an equal weight of grain is to be fed.

Ingredient	Diet No.					
	1	2	3	4	5	6
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Ground yellow corn.....	20.0		35.0	25.0		35.0
Ground wheat.....	25.0	10.0		10.0	45.0	
Ground barley, milo, or hegari.....		35.0				
Ground oats or wheat middlings.....			10.0	10.0		10.0
Soybean meal.....	20.0	20.0	20.0	20.0	20.0	20.0
Cottonseed meal, peanut meal, corn gluten meal, hempseed meal, sesame meal, or soybean meal.....	13.0	13.0	14.0	15.0	12.0	13.0
Fish meal.....			2.0			2.0
Meat scrap.....		3.0			4.0	
Dried skim milk or dried buttermilk.....	6.5			4.0		
Dried whey.....		6.5	6.5	5.3		
Alfalfa meal.....	10.0	7.0			8.0	8.0
Dried distillers' solubles.....			7.8	5.0	6.5	6.5
Steamed bonemeal.....	2.0	2.0	1.0	2.0	1.0	2.0
Ground limestone or oystershell.....	2.0	2.0	2.0	2.0	2.0	2.0
Manganized salt.....	1.5	1.5	1.5	1.5	1.5	1.5
Vitamin A and D feeding oil.....	( <sup>1</sup> )	( <sup>1</sup> )	.2	.2	( <sup>1</sup> )	( <sup>1</sup> )
Total.....	100.0	100.0	100.0	100.0	100.0	100.0

<sup>1</sup> If the chickens do not have access to direct sunlight, add 0.2 percent of vitamin A and D feeding oil.

TABLE 4.—Suggested all-mash laying diets.

Ingredient	Diet No.					
	1	2	3	4	5	6
	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>	<i>Percent</i>
Ground yellow corn.....	42.5	20.0	43.5			
Ground wheat.....		27.5		42.5	36.5	
Ground oats.....	10.0	10.0	10.0	20.0		
Ground barley.....					30.0	28.0
Ground milo or hegari.....						40.0
Wheat middlings, standard.....	15.0	15.0	15.0			
Wheat bran.....	5.0		5.0	10.0		
Soybean meal.....	12.0	9.0	15.0	12.0	12.0	12.5
Corn gluten meal or soybean meal.....				3.0	4.0	
Peanut, sesame, hempseed or soybean meal.....	3.0	5.0			3.0	5.0
Meat scrap.....	2.0	2.0	1.0	1.0	2.0	2.0
Dried skim milk.....			1.5			
Dried whey.....				4.5		
Alfalfa meal.....	4.0	5.0			6.0	6.0
Dried distillers' solubles.....			2.0			
Ground limestone.....	3.0	3.0	3.5	3.5	2.5	2.5
Steamed bonemeal.....	2.5	2.5	2.5	2.5	3.0	3.0
Manganized salt.....	.8	.8	.78	.78	.8	.8
Vitamin A and D feeding oil.....	.2	.2	.22	.22	.2	.2
Total.....	100.0	100.0	100.00	100.00	100.0	100.0

TABLE 5.—Suggested laying mash<sup>s</sup> with which an equal weight of grain is to be fed

Ingredient	Diet No.					
	1	2	3	4	5	6
Ground yellow corn.....	Percent 25.0	Percent	Percent 30.0	Percent	Percent	Percent
Ground wheat.....		25.0		23.5	12.0	
Ground oats.....	10.0	10.0	10.0	20.0		
Ground barley.....					30.0	13.0
Ground milo or hegari.....						30.0
Wheat middlings, standard.....	10.0					
Wheat bran.....		10.0	10.0			
Soybean meal.....	24.0	20.0	26.0	27.5	20.0	22.5
Corn gluten meal or soybean meal.....				6.0	7.5	
Peanut, sesame, hempseed or soybean meal.....	5.0	8.0			4.0	7.5
Meat scrap.....	4.0	4.0	2.0	2.0	3.5	4.0
Dried skim milk.....			3.0			
Dried whey.....				9.0	2.0	
Alfalfa meal.....	9.0	10.0			10.0	10.0
Dried distillers' solubles.....	2.0	2.0	7.0			2.0
Ground limestone.....	5.5	6.0	6.0	6.5	5.5	5.5
Steamed bonemeal.....	3.5	3.0	4.0	3.5	3.5	3.5
Manganized salt.....	1.6	1.6	1.56	1.56	1.6	1.6
Vitamin A and D feeding oil.....	.4	.4	.44	.44	.4	.4
Total.....	100.0	100.0	100.00	100.00	100.0	100.0

TABLE 6.—Suggested all-mash breeding diets

Ingredient	Diet No.					
	1	2	3	4	5	6
Ground yellow corn.....	Percent 38.0	Percent	Percent 39.5	Percent	Percent	Percent
Ground wheat.....		28.5		39.5	37.5	
Ground oats.....	10.0	10.0	10.0	20.0		
Ground barley.....					30.0	27.5
Ground milo or hegari.....						40.0
Wheat middlings, standard.....	15.0	15.0	15.0			
Wheat bran.....	10.0		10.0	12.0		
Soybean meal.....	7.5	5.0	9.0	9.0	12.0	12.0
Corn gluten meal or soybean meal.....				3.0	3.0	
Peanut, sesame, hempseed or soybean meal.....	2.5	4.0				3.0
Fishmeal.....		1.5		2.0	2.5	1.5
Dried skim milk.....	2.5		4.0			3.0
Meat scrap.....	2.0	1.5	1.5			
Dried whey.....		3.0		7.5	2.5	
Alfalfa meal.....	4.0	5.0			6.0	6.0
Dried distillers' solubles.....	2.0		4.0			
Ground limestone.....	3.0	3.0	3.5	3.5	2.5	2.5
Steamed bonemeal.....	2.5	2.5	2.5	2.5	3.0	3.5
Manganized salt.....	.7	.7	.67	.67	.7	.7
Vitamin A and D feeding oil.....	.3	.3	.33	.33	.3	.3
Total.....	100.0	100.0	100.00	100.00	100.0	100.0

TABLE 7.—Suggested breeding mash<sup>es</sup> with which an equal weight of grain is to be fed.

Ingredient	Diet No.					
	1	2	3	4	5	6
Ground yellow corn	25.0		25.0			
Ground wheat		25.0		20.0	7.5	
Ground oats	10.0	10.0	10.0	10.0		
Ground barley					30.0	12.5
Ground milo or hegari						30.0
Wheat middlings, standard	10.0					
Wheat bran		10.0	10.0	12.5		
Soybean meal	20.0	12.5	22.5	20.0	20.0	25.0
Corn gluten meal or soybean meal				6.0	7.5	
Peanut, sesame, hempseed or soybean meal		9.0				
Fish meal		3.0		4.0	5.0	2.5
Meat scrap	5.0	3.0	3.0			
Dried skim milk	5.0		8.0			8.0
Dried whey		6.0		15.0	8.0	
Alfalfa meal	9.0	10.0			10.0	10.0
Dried distillers' solubles	4.5		9.0			
Ground limestone	5.5	8.0	6.5	6.5	6.0	6.0
Steamed bonemeal	4.0	3.5	4.0	4.0	4.0	4.0
Manganized salt	1.4	1.4	1.33	1.33	1.4	1.4
Vitamin A and D feeding oil	.6	.6	.67	.67	.6	.6
Total	100.0	100.0	100.00	100.00	100.0	100.0

TABLE 8.—Suggested substitutes for fish meal, meat scrap, dried skim milk, and alfalfa meal.

Ingredient	Substitute for—			
	Fish meal	Meat scrap	Dried skim milk	Alfalfa meal
	Percent	Percent	Percent	Percent
Soybean meal	87.0	75.0	50.0	25.0
Corn gluten meal				25.0
Steamed bonemeal	5.0	13.0		
Dried distillers' solubles <sup>1</sup> or dried whey	6.0	10.0	50.0	50.0
Salt	2.0	2.0		
Total	100.0	100.0	100.0	100.0
Quantity required to replace 1 pound of fish meal, meat scrap, or dried skim milk and enough ground grain to keep unchanged the total weight of the feed mixture in which the substitution is made. <sup>2</sup>	Pounds 2.5	Pounds 2.0	Pounds 2.0	Pounds 1.0

<sup>1</sup> Or other fermentation product or byproduct that contains at least 9,000 micrograms of riboflavin per pound.

<sup>2</sup> Any feed mixture in which this substitute for alfalfa meal is used should contain the maximum quantity of vitamin A from fish oil or fish-liver oil that is permitted under W. P. B. Limitation Order L-40.

<sup>3</sup> Thus, for example, 2.5 pounds of the substitute for fish meal will replace 1 pound of fish meal and 1.5 pounds of ground grain, but 1 pound of the substitute for alfalfa meal will replace only 1 pound of alfalfa meal.



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